

CLAIMS

1. A method of forming a coating on a powdered substrate, which method comprises introducing an atomised liquid and/or solid coating forming material and separately transporting a powdered substrate to be coated into an atmospheric plasma discharge and/or an ionised gas stream resulting therefrom, and exposing the powdered substrate to the atomised liquid and/or solid coating forming material.
2. A method in accordance with claim 1 wherein the powdered substrate is transported through the atmospheric plasma discharge and/or an ionised gas stream resulting therefrom by being dropped under gravity or entrained in a carrier gas.
3. A method in accordance with claim 1 wherein the powdered substrate is transported through the atmospheric plasma discharge and/or an ionised gas stream resulting therefrom by being carried on a support (68).
4. A method in accordance with claim 3 wherein the support is selected from a fluidised bed, a reel to reel web support (68), a conveyor belt or a vibrating conveyor.
5. A method in accordance with claim 4 wherein the reel to reel web support is made from a non-woven fabric.
6. A method in accordance with claim 4 or 5 wherein the reel to reel web support for the powdered substrate comprises two layers of a non-woven fabric material between which, in use, the powdered substrate is sandwiched.

7. A method in accordance with any preceding claim wherein the atomised liquid and/or solid coating forming material is introduced into an atmospheric plasma discharge and/or an ionised gas stream resulting therefrom by direct injection.
8. A method in accordance with any preceding claim wherein the powdered substrate to be coated is selected from metals, metal oxides, silica and silicates, carbon, polymeric powdered substrates, dyestuffs, fragrances, flavouring powdered substrates pharmaceutical powdered substrates and/or biologically active powdered compounds.
9. An apparatus for forming a coating on a powdered substrate in accordance with the method of any preceding claim, which apparatus comprises a means for generating an atmospheric pressure plasma discharge (20) within which, in use, the powdered substrate to be coated is introduced, an atomiser (74) for providing an atomised coating-forming material within the plasma discharge and means (68, 70, 71, 72) for introducing and or transporting powdered substrate through the atmospheric pressure plasma discharge (25, 60).
10. An assembly in accordance with claim 9 wherein the atmospheric plasma is generated between spaced apart parallel electrodes which are either flat, parallel or concentric parallel electrodes.
11. An assembly in accordance with claim 10 comprising a first and second pair of vertically or horizontally arrayed, parallel spaced-apart planar electrodes (21, 22, 23, 24) with at least one dielectric plate (27) between said first pair (21, 22), adjacent one electrode and at least one dielectric plate (27) between said second pair (23, 24) adjacent one electrode, the spacing between the dielectric plate (27) and the other dielectric plate or electrode of each of the first and second pairs of electrodes forming a first and second plasma region (25, 600, which assembly also comprises a means of transporting a powdered substrate successively through said first and second plasma regions (68, 70, 71, 72).

12. An assembly in accordance with claim 11 wherein the electrodes (21, 22, 23, 24) are vertically arrayed and the means of transporting the powdered substrate through said first and second plasma regions is by way of a reel to reel web support (68, 70, 71, 72).
13. An assembly in accordance with claim 11 or 12 wherein each electrode (21, 22, 23, 24) is in the form of a watertight box having a side formed by a dielectric plate (27) having bonded thereto on the interior of the box a planar electrode (26) together with a liquid inlet (28) adapted to spray water or an aqueous solution onto the face of the planar electrode (26).
14. A coated powdered substrate prepared in accordance with the method of any one of claims 1 to 8.
15. Use of a coated powdered substrate in accordance with claim 14 as a controlled release means for fragrances, flavours, pharmaceuticals and/or dyestuff and/or as a barrier means.
16. Use of a coated powdered substrate in accordance with claim 14 to improve compatibility thereof as reinforcing or property modifying fillers in rubbers and plastics.
17. Use of a coated powdered substrate in accordance with claim 14 to improve compatibility thereof improved compatibility may also be utilised for dispersions such as dyestuffs/pigments, antioxidants and UV stabilisers in polymer materials and also formulated products such as paints and cosmetics.
18. Use of a coated powdered substrate in accordance with claim 14 as separation media or as support for separation media.
19. Use of a coated substrate in accordance with claim 14 as a catalyst and/or catalyst support means.